WATER QUALITY CODE

for the

PICURIS PUEBLO

Adopted May 11, 1995

Revised May 2000

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SECTION I. INTRODUCTION AUTHORITY. AND APPLICABILITY

Pursuant to authority set forth in Section 518 of the Clean Water Act, enacted February 4, 1987 (33 U.S.C. § 1377), the Tribal Council of the Picuris Pueblo, a federally-recognized Tribe of Indians, hereby enacts the Water Code for the Pueblo of Picuris (hereinafter: "this Code", "Water Quality Standards," or "Standards").

The purposes of these water quality standards are to:

A. Designate the existing and attainable uses for which the surface water of the Picuris Pueblo (hereinafter: "the Pueblo"), shall be protected;

B. Prescribe water quality criteria (narrative and numeric) to sustain the designated uses;

C. Assure that degradation of existing water quality does not occur; and

D. Promote the social welfare and economic well being of the Pueblo.

These Standards are consistent with Section 101(a)(2) of the Clean Water Act (33 U.S.C. § 125l(a)(2)) which declares ~~that~~ "it is the national goal that, wherever attainable, **an** interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983..." Agriculture, primary contact, municipal and industrial uses, recharge of domestic water supply via surface waters, and irrigation are other beneficial uses of Pueblo waters. Contamination that may result from such uses shall not lower the quality of the water below what is required for recreation and the protection and propagation of fish, shellfish, and wildlife.

The criteria, numeric and narrative, contained in this Code will be part of the permitting and management process for all dischargers who are subject to Federal, State, or Pueblo regulations. These criteria shall be used in existing procedures (or in any new procedure or process that may be created) to determine when a designated use is threatened. If criteria are not met, the permitting and management process may be expected to require advanced treatment technologies for point sources and to implement such best management practices as are applicable for nonpoint sources.

Applicability-The Code applies to all Tribal waters, that is, all waters within the exterior boundaries of the Picuris Pueblo Indian Reservation and Grant Lands (hereinafter: "Reservation") including water situated wholly or partly within or bordering upon the Reservation. Waters that do not combine with other surface or subsurface waters, such as stock tanks or treatment lagoons, are private waters and excluded from these Standards. The specified criteria apply to substances attributable to discharges, nonpoint sources, or instream activities. The criteria shall not apply to acts of Cod or to natural phenomena.

General Standards-The General Standards in SECTION III of this Code shall be maintained at all times and apply to streams, lakes, reservoirs, canals, drains, ponds, springs, and wetlands, whether, they are perennial, ephemeral, or intermittent waterbodies. Numeric criteria particular to a use shall be maintained any time the flow equals or exceeds the four-day three-year low flow value (4Q3). When intermittent and ephemeral streams have a low flow value of zero, all discharges shall meet standards for the designated uses. The criteria assigned to a waterbody are the ones required to sustain all designated uses of the waterbody. The water that is within reservoirs used for water treatment are exempt from these criteria but the criteria apply to receiving bodies of water affected by the effluent from such reservoirs. The Pueblo shall issue and approve surface water designations for tribal waters and shall determine the suitability of bodies of water for primary contact purposes.

Anti degradation Policy-The anti degradation policy for Tribal waters and the procedures for implementing it are in SECTION II of this Code.

Environmental Office-The Picuris Pueblo Environmental Office shall serve under the direction of the Governor and the Tribal Council of the Pueblo. The Environmental Office shall work in cooperation with the **U.S.** Environmental Protection Agency and other agencies of Federal, Tribal, and State governments. The duties of the Environmental Office are detailed in the implementation Plan (SECTION II of this Code).

Revisions and Public Hearing-In accordance with section 303(c)(1) of the Clean Water Act (33 U.S.C. § 1313(c)), public hearings shall be held at least once each three-year period for the purpose of reviewing the Code and proposing amendments, as appropriate, or to incorporate by reference other regulations. Revisions shall include relevant scientific and engineering advances with respect to water quality and waste treatment. If water quality monitoring identifies reaches where attainable quality is less than existing water quality standards, the standards may be modified to reflect attainability. Modification shall be carried out in accordance with use attainability analysis procedures, development of a site specific standard, or other appropriate methods. The Pueblo will correct errors resulting from inadequate and erroneous data or human or clerical oversight. The discovery of such errors does not render the unaffected standards invalid.

Compliance Schedules-It is the policy of the Pueblo to allow on a case-by-case basis the inclusion of a compliance schedule in a National Pollutant Discharge Elimination System (NPDES) permit issued to an existing facility. Such a schedule will provide a permittee with adequate time, not to exceed three years, to make treatment modifications so that the resulting effluent meets final permit requirements. Compliance schedules may be included in NPDES permits at the time of permit reissuance or modification and shall require compliance at the earliest practicable time before the three-year limit has expired. Duration and schedule of activities shall also be specified ~~so as~~ to measure progress toward final project completion.

Variances-The Pueblo may allow variances from the Water Quality Standards on a case-by-case basis. A variance from the Pueblo's criteria may be allowed in certain cases where the appropriateness of the specific criteria is questionable. The variance provides a period of time during which issues concerning the appropriateness of the criteria may be resolved. A variance shall be valid for no more than three years. Variances are not renewable but may be reissued again upon adequate justification. **A** variance shall be granted only after appropriate public participation and EPA review and approval. Variance from criteria will be allowed for anticipated non-attainment **of** water quality standards due to one or more of the reasons listed in **40** CFR 131.10 (g). Variance from criteria are for specific pollutants, time-limited, and shall not supersede the currently designated use. Variances are to be issued instead of removing a designated use for a waterbody where such use is not now attainable but can be expected with reasonable progress towards water quality.

Short Term Exceedances-The Environmental Office with consent from the Tribal Council of the Pueblo may authorize short-term activities, which might cause a violation of the Pueblo's Water Quality Standards. Such authorization shall not be granted for activities which could result in the adverse impact on any federally endangered or threatened species or on the critical habitat of such species or which could result in the irreversible degradation of the water quality. The Tribal Council and the environmental office shall specify the degree of exceedance, the time limit and restoration procedures where applicable. The Pueblo may include additional requirements for short-term exceedances in related environmental regulations such as a Water Quality Management Plan. These short-term activities will take place whenever necessary and without public notice. Such short-term activities are those which are necessary to accommodate legitimate uses, emergencies, or to protect public health and welfare and in which no permanent or long-term impairment of beneficial uses is likely to result. Such restricted activities that may be categorically excluded from the Water Quality Standards include but are not limited to bank stabilization, mosquito abatement, algae and weed control, tracers used in hydrological studies, or activities, which result in overall enhancement or maintenance of beneficial uses. Short Term Exceedances are not intended to supersede existing Tribal, Federal, or State permitting processes or requirements.

Dispute Resolution Mechanism - Disputes due to differing water quality standards between the Pueblo and a State or between the Pueblo and another Tribe shall be resolved using the Dispute Resolution Mechanism promulgated by the EPA in 40 CFR Section **13**1.7.

Biological Integrity **of** the Aquatic Community - Biocriteria will be applied to protect all categories of waters with an aquatic life use. Biological Integrity, the protection of aquatic communities to their most natural condition, shall be protected and maintained through this narrative Hiocriteria statement. In addition, assessments including the sampling of the aquatic community, and the use of multi-metric indices also serve as Biocriteria to maintain and protect biological integrity. The biological community structure and function, as well as the physical habitat shall be assessed, maintained, protected, and restored to the highest potential use.

The application of biological criteria will be based on the requirement that the biological integrity of the waters impacted by point and non-point source pollution, and other anthropogenic impacts, will not be significantly impaired when compared with similar least impacted watersheds

The reference conditions shall be determined by consistent sampling and reliable measures of indicative aquatic communities (e.g. benthic macroinvertebrate and fish community structure) established by the Picuris Pueblo Environmental Department and may be used in conjunction with accepted chemical, physical, microbiological and toxicological water quality measurements, and records as deemed necessary for the purpose.

SECTION II. ANTI DEGRADATION POLICY AND IMPLEMENTATION PLAN,

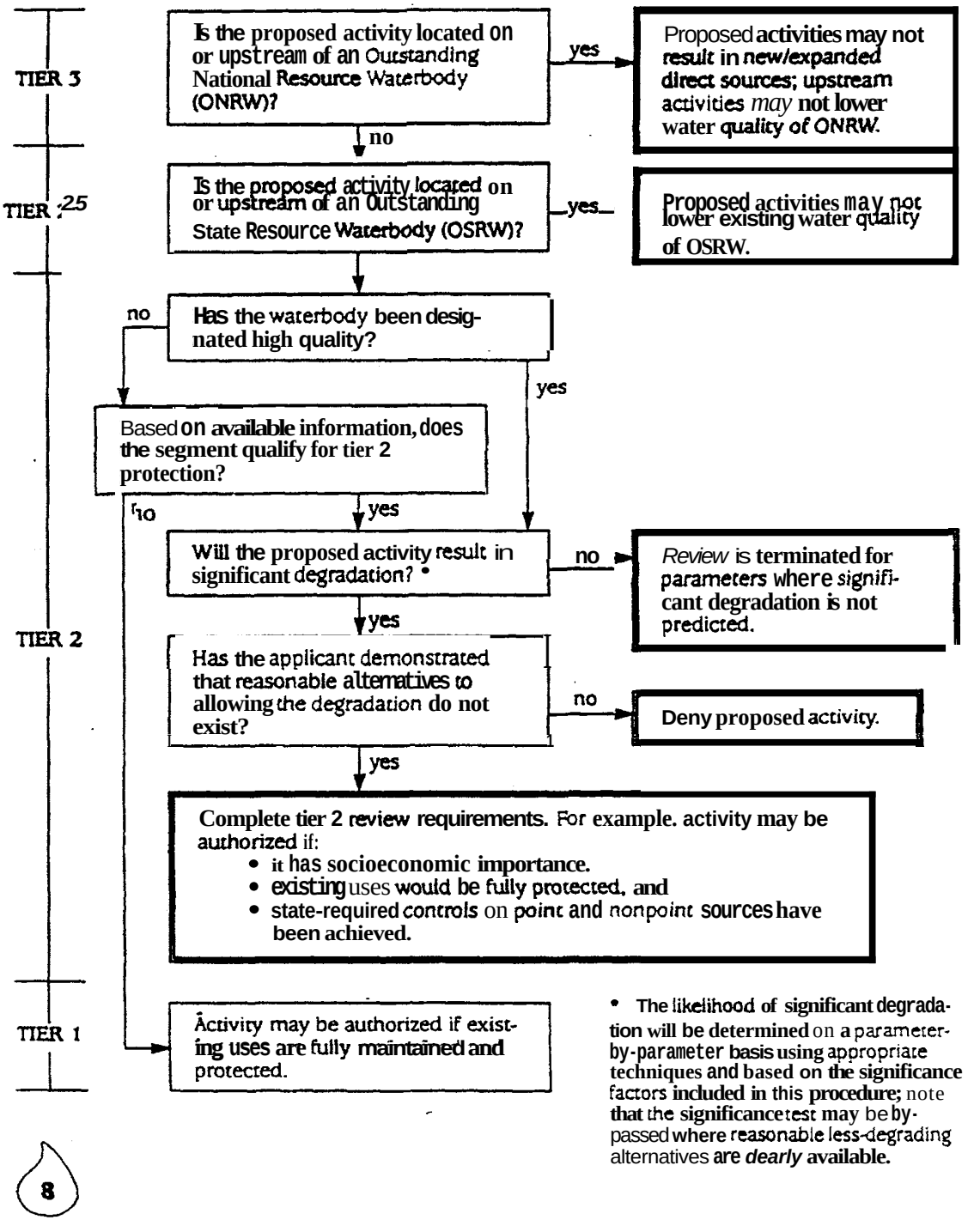
Anti degradation Policy

Existing water uses and the level of water quality necessary to protect existing uses shall be maintained and protected.

It is a goal that all waters will exceed levels necessary to support propagation of fish, aquatic assemblages, wildlife, recreation, and ceremonial use, unless it is found by the Pueblo that a lower level of water quality is required in order to accommodate important tribal economic or social development in the area in which the waters are located (Tier **2).** High quality waters may be specifically identified in future triennial revisions, based on further assessment of water quality. Degradation of water quality may not occur without full satisfaction of governmental and public participation requirements. In permitting such degradation of water quality, the Pueblo shall require the highest statutory and regulatory requirements for all new and existing point sources and such best management practices as are applicable for nonpoint source control. See Figure 1.

FIGURE 1

ANTIDEGRADATION IMPLEMENTATION FLOW CHART



Source: **EPA**

Where high quality water constitutes an outstanding national or'tribal resource or the waters are of exceptional recreational or ecological significance, the water quality and uses shall be maintained and protected by water quality controls, maintenance of natural flow regimes, protection of instream habitats, and pursuit of land use practices protective of the watershed.

In those cases where thermal discharge may impair water quality, the anti degradation policy and implementing methods shall be consistent with Section 316 of the Clean Water Act, as amended [(33 U.S.C. § 1326(1987)].

Implementation Plan and Duties of the Environmental Office

The Environmental Office acting under authority delegated by the Tribal Council shall implement the water quality standards and the anti degradation policy by establishing and maintaining controls on the discharge of pollutants to surface waters.

The Environmental Office shall, subject to availability of funds:

- Work in conjunction with Federal, Tribal, and State agencies as appropriate;

- Establish and maintain controls on the discharge of pollutants to surface waters. Such controls shall be carried out in a stepwise process involving several interrelated programs;

- Recommend to the Tribal Council any permitting or management regulations which would be consistent with the Water Quality Standards. The Tribal Council may set permit requirements in addition to those of this Code when enacted;

- Obtain information pertinent to the effect of the effluent on the receiving Waters and advise the prospective discharger of requirements for obtaining a permit to discharge, including any permit requirements as the Pueblo itself may enact subsequent to the enactment of this Code;

- assess the probable effects of effluent on receiving waters relative to the designated uses and numeric and narrative standards;

- designate Pueblo streams as perennial, ephemeral or intermittent in accordance with the Pueblo Water Quality Standards and determine low flow numeric values;

- conduct water quality surveillance of Pueblo waters to assess the effectiveness of pollution controls and prevention and to determine whether water quality standards are being attained. Include a review of existing database adequacy and obtain any needed data by conducting an intensive analytical survey of the receiving waters;

- conduct biological monitoring of fish, invertebrate, plant bioassay, and sediment quality to assess the physical and chemical factors relative to heavy metals and toxic substance contamination;

- require the highest level and best degree of wastewater treatment practicable to protect and maintain the designated uses and existing water quality of the receiving waters;

- submit requirements of or comments on effluent limitations for inclusion in any Federal permit issued to a discharger pursuant to Section **402** or **404** of the Clean Water Act **(33** U.S.C. § **1342).** These effluent limitations shall be included in any such permit as a condition for Tribal certification pursuant to Section **401** of the Clean Water Act **(33** U.S.C. § **1341);**

- develop and pursue inspection and enforcement programs which will ensure that dischargers comply with requirements of these Water Quality Standards, satisfy the requirements of any later Pueblo permit regulations, and complement EPA's enforcement of Federal permits;

- ensure that the provisions for public involvement required by the Water Code and the Clean Water Act are followed **(40** CFR Part 25);

- provide continuing technical training for wastewater treatment facility operators through the utility operators training and certification programs;

- seek funds to assist the construction of Pueblo owned wastewater treatment facilities; for example, through the construction grants program authorized by Section **201** of the Clean Water Act **(33** U.S.C. § **1281);**

- encourage, in conjunction with other agencies voluntary implementation of best management practices noted for controlling non point source pollution, and to comply with the Water Quality Standards and with the Clean Water Act;

- evaluate effectiveness of best management practices selected to prevent or abate non-point sources of water pollutants:

SECTION III. GENERAL STANDARDS

Watercourses shall be free of any water contaminant in such quantity and of such duration as may with reasonable probability injure human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property. In addition, the following narrative standards apply to all Pueblo waters, unless stricter standards are imposed in section IV.

A. Stream Bottom Deposits. The stream shall be free from water contaminants from other than natural causes that will settle and cause deleterious effects to the aquatic biota or significantly alter the physical or chemical properties of the bottom.

B. Floating Solids, Oil, and Grease. All waters shall be free from objectionable oils, scum, foam, grease, and other floating materials and suspended substances of a persistent nature resulting from other than natural causes (including visible films of oil, globules of oil, grease, or solids in or on the water, or coatings on stream banks and stream bottoms),or that would damage or impair the normal growth, function or reproduction of wildlife, plant, or aquatic life.

C. **Color**. Materials producing true color resulting from other than natural causes shall not create an aesthetically undesirable condition; nor should color impair the attainable uses of the water nor harm aquatic life.

D. **Odor and Taste.** Water contaminants from other than natural causes shall be limited to concentrations that will not impart unpalatable flavor to fish, or result in offensive odor or taste arising from the water, or otherwise interfere with the existing and attainable uses of the water, nor shall taste and odor-producing substances of other than natural origin interfere with the production of a potable water supply by modern treatment methods.

E. **Nuisance Conditions.** Plant nutrients or other substances stimulating algal growth from other than natural causes shall not be present in concentrations which will produces objectionable algal densities, nuisance aquatic vegetation, result in a dominance of nuisance species instream, or otherwise cause nuisance conditions. When stricter requirements are not established elsewhere in this code, the dissolved oxygen shall be maintained at 2 mg/l in order to prevent nuisance conditions from other than natural causes. The phosphorus and nitrogen concentrations shall not be increased to levels which result in man-induced eutrophication problems. The Tribal Council may establish nutrient limitation for lakes, reservoirs, and streams, and shall incorporate such limitations into appropriate water quality management plans.

F. **Pathogens.** The stream shall be virtually free from pathogens which include bacteria, viruses, or parasites. In particular, waters used for irrigation of table crops such as lettuce shall be virtually free of *Salmonella* and *Shigella* species.

G. Turbidity. Turbidity attributable to other than natural causes shall not reduce light transmission to the point that the aquatic biota is inhibited or that will cause an unaesthetic and substantial visible contrast with the natural appearance of the water. Turbidity attributable to natural causes is not subject to these standards. Specifically, turbidity shall not exceed 5 NT'U over natural background when natural background turbidity is 50 NTU or less; there shall not be more than a 10% increase in turbidity when background turbidity is more than 50 NTU.

H. Mixing Zones. If a discharge permit applicant can prove to the satisfaction of the Picuris Pueblo Tribal Council, that water quality criteria can be achieved and maintained through instantaneous mixing, some dilution may be allowed (e.g., through the use of high rate diffusers). Such allowances will granted on a case-by-case basis. The size of mixing zones shall be less than 1/3 of the cross-sectional area or critical stream flow at or above **4Q3** conditions of the receiving stream. In intermittent or ephemeral streams, discharges shall meet all applicable numeric and narrative criteria at the point of discharge. There shall be no acute toxicity in the mixing zone. Numeric acute criteria shall be attained at the point of discharge. There shall be no chronic toxicity at the edge of the mixing zone. Numeric chronic criteria shall be attained at the edge of the mixing zone. Mixing zones are not allowed for discharges to publicly owned lakes or reservoirs; these effluents shall meet all applicable numeric and narrative criteria at the point of discharge. Mixing zones shall not overlap ceremonial or recreational sites. Requirements for mixing zones shall be consistent with those established in other regulations such as water quality management plans and implementation plans developed by the Pueblo or by the Environmental Protection Agency.

In any waters receiving a waste discharge, a continuous zone must be maintained where the water is of adequate quality to allow the migration of aquatic life with no significant effect on their population. This is known as a zone of passage.

I. Radioactivity. Unless otherwise outlined in these standards, the radioactivity of surface water shall be maintained at concentrations which do not exceed the maximum natural background concentrations in surface waters of the Pueblo.

J. Temperature. The introduction of heat by other than natural causes shall not increase the temperature, outside the mixing zone, by more than 2.7" C (5° F) in a stream, based upon the monthly average of the maximum daily temperatures measured at mid-depth or three feet (whichever is less) outside the mixing zone. In lakes, the temperature of the water column or epilimnion (if thermal stratification exists) shall not be raised more than 1.7" C **(3**" F) above that which existed before the addition of heat of artificial origin, based upon the average of temperatures taken from the surface to the bottom or surface to the bottom of the epilimnion (if stratified). The normal daily and seasonal variations that were present before the addition of heat from other than natural sources shall be maintained. In no case shall man-introduced heat be permitted when the maximum temperature specified for the reach (20" C/68° F for cold water fisheries and 32.2° C/90°F for warm water fisheries) would thereby be exceeded. High water temperatures caused by unusually high ambient air temperatures are not violations of these standards.

K. **Salinity/Mineral Quality** (total dissolved solids, chlorides, and sulfates). Existing mineral quality shall not be altered by municipal, industrial, and instream activities, or other waste discharges so as to interfere with the designated uses. No increase exceeding 1/3 over naturally

occurring levels may be permitted. Numeric criteria for chlorides at 230 mg/l, for sulfates at 250 mg/l, and for total dissolved solids at 500 mg/l shall not be exceeded.

L. The **pH** of a stream or a lake shall not fluctuate in excess of 1.0 pH unit over a period of 24 hours for other than natural causes.

M. If the stream is capable of supporting aquatic life, the **dissolved oxygen** standard shall not be less than 5 mg/l.

N. **Dissolved Gases.** Surface water shall be free **of** nitrogen and other dissolved gases at levels above 110% saturation when this supersaturation is attributable to municipal, industrial or other discharges.

0. **Toxic Substances.** Toxic substances such as, but not limited to, pesticides, herbicides, heavy metals, and organic solvents, shall not be present in receiving waters in such quantities as to be toxic to human, animal, plant, or aquatic life nor as to interfere with the normal propagation, growth, and survival of the sensitive indigenous aquatic biota. For lists of the applicable toxic substances, criteria published, and sensitive indigenous species/lifestages, reference should be made to the procedures implementing this toxic substances narrative contained in the rules, regulations, and guidelines of the Environmental Protection Agency, or any rules, regulations and guidelines adopted by the Pueblo subsequent to adoption of these standards. Within the mixing zone, there shall be no acute toxicity. There shall be no chronic toxicity at the edge of the mixing zone.

Biomonitoring testing following current EPA test methods shall be used to determine compliance with the narrative criteria. For substances lacking EPA published criteria, biomonitoring data may be used to determine compliance with this narrative standard in accordance with EPA standard acute and chronic biological test protocols. These protocols can be found in U.S. Environmental Protection Agency *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA-600/4-90/027F; August, 1993), *Post Third Round NPDES Permit Implementation Strategy* (adopted October 1, 1992), *Short-Term Methods-for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA -/600/4-91/002; July 1994), *Technical Support Document For Water Quality-based Toxics Control,* (EPA\505\2-90-001, March 199l)., *Quality Criteria for Water,* 1986 or the most current version thereof. If the Pueblo needs to derive numeric criteria, without actually conducting toxicity tests, they shall use the AQUIRE (Aquatic Toxicity Information Retrieval) database EPA's Guidance, *Guidelines for Deriving. Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses.*

In the event that sufficient data is not available to derive a numeric criterion following the above guidance, the Pueblo may use the results of toxicological studies to calculate a criterion based on the following methods:

a) concentrations of non-persistent toxic materials shall not exceed concentrations which are chronically toxic (as determined from appropriate chronic toxicity data or calculated as 10% of LC50 values) to representative, sensitive aquatic organisms.

b) concentrations of persistent toxic materials that do not bioaccumulate shall not exceed concentrations which are chronically toxic (as determined from appropriate chronic toxicity data or calculated as 5% of LC50 values) to representative, sensitive aquatic organisms; and

c) concentrations of toxic materials that bioaccumulate shall not exceed concentrations which are chronically toxic (as determined from appropriate chronic toxicity data or calculated as 1% of **LC50** values) to representative, sensitive aquatic organisms.

Toxicants in the receiving water known to be persistent, bioaccumulative, carcinogenic, synergistic with other waste stream components, or antagonistic with non-waste stream components will be addressed on a case-by-case basis.

SECTION IV. WATER BODY USES

1. STREAM USE DESIGNATION

A. The following water body uses and the standards pertaining thereto shall apply to the eastern portions of the Rio del Pueblo and to the Rio Santa Barbara and to other perennial tributaries above (east of) the confluence of the Rio del Pueblo and the Rio Santa Barbara. The criteria for uses above said confluence shall also apply to perennial tributaries to the Rio del Pueblo and the Rio Santa Barbara, wetlands along these waters including tributaries associated with those wetlands, and any other perennial standing waters along the Rio del Pueblo and Rio Santa Barbara: Recharge of domestic water supply, fish culture, high quality cold water fishery, irrigation, livestock watering and wildlife habitat, municipal and industrial water supply, and primary contact use.

B. The following water body uses and the standards pertaining thereto shall apply to perennial streams above and below the confluence of the Rio del Pueblo and the Rio Santa Barbara. These include Picuris Creek, Chamisal Creek, and the lower portions of the Rio del Pueblo and the Rio Santa Barbara, after their confluence; Embudo Creek. Standards shall apply to any other stream segment which is determined to be perennial, any standing waters including, but not limited to the two fishing ponds and wetlands associated with said streams and standing waters: marginal coldwater fishery, warmwater fishery, irrigation, livestock watering and wildlife habitat, primary contact use and recharge of domestic water supply.

C. The following water body uses and the standards pertaining thereto shall apply to all intermittent or ephemeral streams, including any associated with standing water and wetlands: livestock watering and wildlife habitat, irrigation, and primary contact use.

2. WATER BODY USES AND SPECIFIC STANDARDS

A. HIGH QUALITY COLDWATER FISHERY USE.

Criteria for High Quality Coldwater Fishery Use incorporates Acute and Chronic Fisheries Criteria with the following additions:

1. The dissolved oxygen shall not be less than 6.0 mg/l, or *85%* of saturation, whichever is greater.
2. Temperature shall not exceed *20"* **C** (68° **F).**
3. pH shall be within the range of 6.6 to 8.8
4. Total phosphorus **(as** P) shall not exceed 0.1 mg/l.
5. Total organic carbon shall not exceed 7 mg/l.
6. Turbidity shall not exceed 10 NTU *(25* NTU in certain reaches where natural background prevents attainment of lower turbidity).
7. Conductivity (at *25°C)* shall not exceed 300 umhos/cm and 1,500 umhos/cm depending on the natural background of particular stream reaches
8. Tables for total ammonia can be found in appendix # 1.
9. Total residual chlorine shall not exceed *0.002* mg/l
10. Total inorganic nitrogen (as N) shall not exceed 1.0 mg/l.

B. MARGINAL COLDWATER USE.

Acute and Chronic Fishery Criteria also apply.

1. Dissolved oxygen shall not be less than 6.0 mg/l.
2. Temperature shall not exceed *25"* C.
3. pH shall be in the range of 6.6 to 9.0.
4. Tables for total ammonia can be found in appendix #1.
5. Total residual chlorine shall not exceed **3** ug/l.

C. WARMWATER FISHERY USE.

Acute and Chronic Fishery Criteria also apply.

1. Dissolved oxygen shall not be less than *5* mg/L.
2. Temperature shall not exceed 32.2°C (90" F).
3. pH will be within the range of 6.0 to 9.0.
4. Tables for total ammonia can be found in appendix # 1.
5. Total residual chlorine shall not exceed 3 ug/l.

ACUTE. FISHERY CRITERIA

◆The following numeric criteria shall not be exceeded.

Analyte (dissolved unless otherwise noted)	Concentration (µg/l)
Aluminum	750
Arsenic	340
Beryllium	130
Cadmium	$1.136672-[\ln(\text{hardness})(0.041838)]\times e^{(1.128[\ln(\text{hardness})]-3.6867)}$
Chlordane, Total	2.4
Chromium**	$e^{(O.819(\ln(\text{hardness})+2.5736))}$
Covver	$e^{(0.9422[\ln(\text{hardness})]\ -1.7408)}$
Cyanide, weak dissociable	22.0
Lead	$1.46203-[\ln(\text{hardness})(0.145712)]\times e^{(1.273[\ln(\text{hardness})]\ -1.46)}$
Mercury, Total	2.4
[illegible]	$e^{(0}$
Selenium, Total	20.0
Silver	$e^{(1.72\ \ln(\text{hardness})]-6.6825)}$
Total Residual Chlorine	19
Zinc	$e^{(0.8473[\ln(\text{hardness})]+0.8618)}$
**The criteria for chromium shall be applied to an analysis which measures both the trivalent and hexavalent ions.	

CHRONIC FISHERY CRITERIA

◆The following numeric criteria shall not be exceeded.

Analyte (dissolved unless otherwise noted).	Concentration (µg/l)
Aluminum	87.0
Arsenic	150
Beryllium	5.3
Cadmium	$1.101672-[\ln(\text{hardness})(0.041838)]\times e^{(0.7852[\ln(\text{hardness})]-2.715)}$
Chlordane (total)	0.0043
Chromium	$e^{(0.8190[\text{in}(\text{hardness})]+0.534)}$
Copper	$e^{(0.8545\ [\ln(\text{hardness})]-1.7428)}$
Cyanide, weak dissociable	5.2
Iron	1.0 mg/L
Lead	$1.46203-[\ln(\text{hardness})(0.145712)]\times e^{(1.273[\ln(\text{hardness})]-4.705)}$
Mercury (total)	0.012
Nickel	$e^{(0.8460[\ln(\text{hardness})]+0.0554)}$
Selenium (total)	*5.0*
Total Residual chlorine	11
[illegible]	$e^{(0.8473[\ln(\text{hardness})]+0.8699)}$
**The criteria for chromium shall be applied to an analysis which measures both the trivalent and hexavalent ions.	

D. LIVESTOCK WATERING & WILDLIFE HABITAT USE

*The following numeric criteria shall not be exceeded.

Analyte (dissolved, except as noted)	Concentration (mg/L, except as noted)
Aluminum	*5.0*
Arsenic	200µg/L
Boron	5.0
Cadmium	0.05
Chromium **	1.0
Cobalt	1.0
Copper	0.5
Cyanide, weak dissociable	*5.2* µg/l
Lead	0.1
Mercury (total)	0.012 µg/l
Selenium (total)	0.002
Total residual chlorine	11 µg/l
Total DDT and metabolites	0.001µg/l
Total PCB's	0.014µg/l
Vanadium	0.1
Zinc	25.0
Radium ($^{226}Ra + ^{228}RA$)	30.0 pCi/L
Tritium	20,000 pCi/L
Gross alpha	15pCi/L

E. IRRIGATION USE

*The monthly geometric mean of fecal coliform bacteria shall not exceed 1,000-colonies/100 ml; no single sample shall exceed 2,000-colonies/ 100 ml.

◆The following numeric criteria shall not be exceeded.

Analyte (Dissolved)	Concentration (mg/L)
Aluminum	5.0
Arsenic	0.10
Boron	0.75
Cadmium	0.01
Chromium **	0.10
Cobalt	0.05
Copper	0.20
Lead	5.0
Molybdenum	0.01
Selenium (in the presence of <500mg/l SO_4)	0.13
Vanadium	0.1
Zinc	2.0
Selenium (in the presence of >500mg/L of SO_4)	0.25

**The criteria for chromium shall be applied to an analysis which measures both the trivalent and hexavalent ions.

F. RECHARGE OF ESTUARY WATER PPI

- The following numeric criteria shall not be exceeded

Analyte (dissolved except as noted)	Concentration (mg/L, except as noted)
Arsenic	0.05
Barium	2
Cadmium	0.005
Chromium**	0.1
Cyanide	0.2
Iron	0.3
Lead	*0.05*
Mercury (total)	0.002
Total Nitrates as N	10.0
Selenium	*0.05*
Silver	0.05
Radium (226Ra + 228Ra)	5 pCi/L
Uranium	***5.0***
Tritium	20,000 pCi/L
Gross alpha	15 pCi/L

**The criteria for chromium shall be applied to an analysis which measures both the trivalent and hexavalent ions.

G. PRIMARY CONTACT

1. The geometric mean maximum for fecal coliform bacteria shall not exceed 200 colonies per 100 **ml.** Compliance with this criteria shall be determined based on a minimum of 5 samples taken over a maximum of 30 days. **A** single sample maximum for fecal coliform bacteria shall not exceed 400 colonies per 100 **ml.** *
2. pH shall be within the range of 6.6 to 8.8.
3. The total dissolved solids of mineral constituents shall not exceed 500 mg/L.
4. Turbidity shall not exceed 25 NTUS.
5. The open water shall be free from algae in concentrations causing a nuisance condition or causing gastrointestinal or skin disorders.

*The standards for ***E.*** *Coli* at a monthly shall not exceed a geometric mean maximum of 126 colonies/100 ml and **a** single sample maximum of 235 colonies/100 ml, in accordance with an illness rate of **8** per 1000-exposures.

Primary contact use: The use of water for the practice of Indian religion and Indian traditional purposes by tribal members of the Pueblo; such use involves the intentional and incidental ingestion of the water and immersion in the water. Recreational use of the water involving prolonged contact and the risk of ingesting water in quantities sufficient to pose a health hazard; an examples is swimming. Any recreational use of the water in which contact with the water need not occur and in which the probability of ingesting water is minimal; examples are fishing and boating.

H. INDUSTRIAL AND MUNICIPAL WATER SUPPLY USE,

General Standards apply to this use.

I. FISH CULTURE USE.

General Standards apply to this use.

SECTION V. SAMPLING AND ANALYSIS

A. All methods of sample collection, preservation, and analysis used in determining water quality and maintenance of these standards shall be in accordance with procedures prescribed by the latest edition of: (1) American Public Health Association, *"Standard Methods for the Examination of Water and Wastewater";* or *(2)"Methods for Chemical Analysis of Water and Wastes";* or (3) EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants, found in 40 CFR part 136, or **(4)** USEPA's "Rapid Bioassesment Protocol II: For Use in Streams and Rivers: Benthic Macroinvertebrates and Fish, or (5) Other methods which may not be EPA approved may be used as determined to be appropriate by Picuris Pueblo Environment Department, (i.e. Hach adaptation of EPA or Standard Methods).

B. Bacteriological Surveys: The monthly geometric mean is used in assessing attainment of standards when a minimum of five samples is collected in a 30-day period. No single sample shall exceed the upper limit for bacterial density, as set forth in section IV, when less than 5 samples are collected in a 30-day period.

C. Sampling Procedures:

1. Streams. Stream monitoring stations below waste discharges shall be located outside the designated mixing zone.

2. Lakes: Sampling in lakes, including artificial lakes, shall be located where the attainment of a water quality standard is to be assessed. Water quality measurements shall be taken at intervals in the water column at a sampling station. For toxic substances and nutrients, the entire water column shall be monitored. For dissolved oxygen in stratified lakes, measurements shall be made in the epilimnion. In non-stratified lakes, measurements will be made at intervals throughout the entire water column.

D. Biological Surveys: any biological assessment program which is undertaken shall be established in accordance with document (4) above, or other established procedures, e.g. River Watch Network adaptation of EPA Rapid Bioassessment Protocol II. As needed, artificial collection sites shall be installed in lowland streambeds to determine potential species diversity under improved stream conditions.

SECTION VI. DEFINITIONS

Absorption- The uptake of water or dissolved chemicals by a cell or organism.

Acute- A stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect observed in 96 hours or less typically is considered acute. When referring to aquatic toxicity or human health, an acute effect is not always measured in terms **of** lethality.

Acute Exposure- Usually, a single exposure or a cluster of exposures within a single 24-hour period.

Acute Toxicity- Toxicity which exerts short-term lethal impacts on representative organisms with **a** duration of exposure generally less than or equal to 48 hours. This will be quantified as a statistically significant difference at the 95% confidence level between survival in the appropriate test organism and a control. Other methods may be used to determine acute effects other than lethality such as, but not limited to behavioral changes or immobilization. *See* EPA/600/4-90/027F, Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms.

Adsorption- The process by which chemicals are held on the surface of a mineral or soil particle.

Agricultural Water Supply Use- The use of water for irrigation.

Algae- Simple plants without roots, stems, or leaves which contain chlorophyll and are capable of photosynthesis.

Alkalinity- The property of water that resists or buffers against changes in pH upon addition of acid or base.

"Allowable Frequency"- The period of time EPA assumes that it will take ecosystems to recover after they have been subjected to chemical stressors. EPA has selected 3 years as their allowable frequency of exceedances.

Ambient- Environmental or surrounding conditions.

Ambient Concentration- The concentration or quantity of chemicals that can be expected to occur in the aquatic environment in water, sediment, and food.

Antagonistic Effects- When two chemicals interfere with the actions of each other.

Anthropogenic Effects- Human induced.

Antidegradation Implementation- Existing, approved antidegradation statements consistent with 40 **CFR** 131.12 may be retained, but procedures for implementation must be established through the State water quality management process (WQM). These procedures will enable the Tribe to determine on a case-by-case basis whether, and to what extent, water quality may be lowered.

Antidegradation Policy- 40 CFR 131.6 requires each State to include an antidegradation policy consistent with 40 CFR 131.12 when submitting water quality standards to EPA. These policies are designed to protect water quality and provide a method of assessing activities that may impact the integrity of the waterbody.

Aquaculture- The cultivation of the natural produce of water such as fish and shellfish as covered in section 318 of CWA.

Aquatic Biota- Animal and plant life in the water.

Aquatic Communities- A biological association consisting of all interacting populations of aquatic species inhabiting a given area or region.

Aquatic Life Criteria- Constituent concentrations, levels, or narrative statements, representing a quality of water that is protective of aquatic life.

Aquifer. Any geological formation containing water, especially one that supplies water for wells, springs, etc.

Arbitrator- EPA employees, employees from other Federal Agencies, or other qualified individuals agreed upon by all parties and who will know the requirements of water quality standards program, will have a basic understanding of the political and economic interests of Tribes, and are expected to fulfill their duties fairly and impartially.

Artificially Created Waters- Man-made waters including irrigation ditches, canals, and created wetlands. The need to develop water quality standards for artificially created waters is determined by EPA and the Tribe on a case-by-case basis.

ASTM- Standard procedures for conducting laboratory testing as defined by the American Society of Testing and Materials (ASTM).

Attainable use- "Attainable use" means a use of surface water which has water quality and all other characteristics necessary to support and maintain the use, as specified in Section IV of these standards, or which would support and maintain the use after the implementation of water quality standards as set forth in this Water Code.

Averaging Periods- The period of time over which the ambient concentration is averaged for comparison with criteria concentrations.

Benthic Macroinvertebrates- The invertebrate organisms living in the water.

Best Management Practices: Practices undertaken to control, restrict, and diminish nonpoint sources of pollution, that are consistent with the purposes of the Pueblo Water Quality Standards and with the narrative and numeric standards contained therein; measures, sometimes structural, that are determined to be the most effective practical means of preventing or reducing pollution of water bodies from nonpoint sources.

Bioaccumulation – The process by which a compound is taken up by an aquatic organism, both from water and through food.

Bioaccurnulation Factor- (BAF) The ratio of the concentration of a chemical in the tissues of an aquatic organism to its concentration in the water. Considered where the organism and the food chain are exposed.

Bioassay- **A** toxicity test using selected organisms to determine the acute or chronic effects of a chemical pollutant or whole effluent.

Biomagnification - The process of a chemical accumulating in a biological food chain by being passed from one organism to another as the contaminated organism is preyed upon by another organism.

Bioconcentration – The process by which a compound is absorbed from water through gills or epithelial tissues and is concentrated in the body.

Carcinogenic: Cancer producing.

cfs: cubic feet per second.

Chronic Toxicity: Toxicity which exerts sub-lethal effects, such as the impairment of growth or reproduction, or which becomes lethal after long-term exposure, generally measured in a 7-day test on representative organisms. This will be quantified as a statistically significant difference at the 95% confidence level between the survival and/or reproduction or growth of the appropriate test organism and the control. See EPA /600/4-91/002, Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms.

Coldwater fishery: A stream reach, lake or impoundment where the water temperature and other characteristics are suitable for the support or propagation or both of Coldwater fish such **as** but not limited to, longnose dace, Rio Grande chub, Rio Grande sucker, brown, cutthroat(including the native Rio Grande cutthroat), brook, or rainbow trout.

Color: Color as used herein means true color as well as apparent color. Color is expressed as "apparent" or "true" color. The apparent color includes color from dissolved materials plus that from suspended matter. By filtering or centrifuging out the suspended materials, the true color can be determined.

Cumulative: Increasing by successive additions.

Designated uses: Those uses set forth in the water quality standards herein.

Dissolved oxygen (DO): The amount of oxygen dissolved in water or the amount of oxygen available for biochemical activity in water, commonly expressed as a concentration in milligrams per liter (mg/1).

Domestic water supply: Water that only requires disinfection in order to be usable for drinking or cooking.

Effluent: Discharge into surface waters from other than natural sources.

Ephemeral stream: A reach of a stream that flows temporarily in direct response to precipitation or snowmelt, the channel bed of which is above the water table.

Epiliminion: The layer of water that overlies the thermocline of a lake and that is subject to the action of wind.

Eutropnication: The maturation of a standing body of water, involving increasing concentration of dissolved nutrients and seasonal oxygen deficiency.

Existing uses: Those uses actually attained in a surface water body on or after November 28, **1975,** whether or not they are referred to in the Pueblo Water Quality Standards.

FDA Alert Limits: Levels promulgated by the **U.S.** Food and Drug Administration concerning concentrations of substances in food.

Fecal coliform bacteria: The portion of the coliform group which is present in the gut or the feces of warmblooded animals. Fecal coliform bacteria generally include organisms which are capable of producing gas from lactose broth in a suitable culture medium within **24** hours at 44.5+/-0.2°C.

Fish culture: Production of Coldwater or warmwater fish in a hatchery or rearing station.

Fishery: A balanced, diverse community of fishes controlled by the water quality, quantity, and habitat of a waterbody.

Flow: Atmospheric precipitation resulting in surface and/or ground water runoff.

FTU: Formazin turbidity units *(See* American Public Health Association, *Standard Methods for the Examination of Water* ***and*** *Wastewater).*

Geometric Mean: a mean calculated by converting all values to logarithms; averaging the logarithms; and determining the antilogarithm of that average.

Indigenous: Produced, growing, or living naturally in a particular region or environment.

Industrial: Refers to production of goods or services for profit.

Industrial water supply use: The use of water with reference to the production of goods or services for profit.

Intermittent stream: A stream or reach of a stream that flows only at certain times of the year, when receiving flow from springs, melting snow, or localized precipitation.

LC-50: The concentration of a substance that is lethal to 50% of the test organisms within a defined time period.

Marginal Coldwater fishery: A stream reach, lake, or impoundment where water temperature and other characteristics are suitable for support of Coldwater fish such as, but not limited to longnose dace, Rio Grande chub, Rio Grande sucker, brown, cutthroat (including the native Rio Grande cutthroat), brook, or rainbow trout, but where temperature and other characteristics may not always be suitable for propagation of Coldwater fish.

Milligrams per Liter (mg/1): The concentration at which one milligram is contained in a volume of one liter, one milligram per liter is equivalent to one part per million (ppm) at unit density.

Mixing zone: A three-dimensional zone in which discharged effluent mixes with the receiving water and within which there is a gradation of water quality.

Narrative standards: A standard or criterion expressed in words rather than numerically.

Natural background: Characteristics that are not man-induced that are related to water quality; the levels of pollutants present in ambient water that are from natural, as opposed to man-induced, sources.

Nonpoint source: A source of pollution that is not a discernible, confined, and discrete conveyance (e.g., run-off from land).

NTU: Nephelometric Turbidity Units; a measure of turbidity in water (see "turbidity," below).

Nuisance condition: A condition involving uncontrolled growth of aquatic plants, usually caused by excessive nutrients in the water.

Nutrient: A chemical element or inorganic compound taken in by green plants and used in organic synthesis.

Perennial stream: A stream or reach of a stream that flows continuously throughout the year, the upper surface of which is generally lower than the water table of the region adjoining the stream.

Persistent: Existing for a long or longer than unusual time or continuously.

pH: The negative logarithm of the effective hydrogen-ion concentration in gram equivalents per liter.

Picocurie (pCi): That quantity of radioactive material producing 2.22 nuclear transformations per minute.

Point source: Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged into a water body; does not include return flows from irrigated agriculture.

Primary contact use: The use of water for the practice of Indian religion and Indian traditional purposes by tribal members of the Pueblo; such use involves the intentional and incidental ingestion of the water and immersion in the water. Recreational use of the water involving prolonged contact and the risk of ingesting water in quantities sufficient to pose a health hazard;

examples are swimming and water skiing. Any recreational use of the water in which contact with the water need not occur and in which the probability of ingesting water is minimal; examples are fishing and boating.

Segment: A surface water body which has common hydrologic characteristics or flow regulation regimes, possesses common natural physical, chemical, and biological characteristics, and exhibits common reactions to external stresses, such as the discharge of pollutants.

Synergism: Cooperative action of discrete agents such that the total effect is greater than the sum of the effects taken independently.

TDS: Total dissolved solids.

Technology-based controls: The application of technology-based effluent limitations as required under Section 301(b) of the Clean Water Act.

Thermal Stratification: temperature-caused horizontal layers of different densities produced in a lake.

Threatened and Endangered Species Habitat: Means a stream reach, lake, spring, and/or pool where water quality, lack of interspecies competition, temperature and instream or benthic habitat provide for the support and propagation of a threatened or endangered aquatic species.

Total Inorganic Nitrogen: The sum of nitrate nitrogen, nitrite nitrogen, and total ammonia nitrogen.

Toxic pollutant: Refers to those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Pueblo or the Environmental Protection Agency Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations, in such organisms or their offspring.

Toxicity: State or degree of being toxic or poisonous.

Turbidity: Refers to water that is cloudy or muddy in physical appearance.

Use-attainability analysis: A structured scientific assessment of the factors affecting attainment of a use for a body of water, which assessment may include physical, chemical biological, and economic factors, such as those referred to in 40 C.F.R. Section 131. 10(g).

Warmwater fishery: A stream reach, lake or impoundment where the water temperature and other characteristics are suitable for the support of warmwater fish such as but not limited to largemouth and smallmouth bass, crappie, white bass, bluegill, flathead catfish. channel catfish, or fathead minnow.

Water Contaminant: Any, substance which alters the physical, chemical, or biological qualities of water.

Water quality-based controls: Effluent limitations, as provided under Section 301(b)(1)(C) of the Clean Water Act, which are developed and imposed on point-source dischargers in order to protect and maintain applicable water quality standards. These controls are more stringent than the technology-based effluent limitations required under other paragraphs of Section 301(b).

Zone of passage: The portion of the receiving water outside the mixing zone (where water quality is, throughout, the same as that of the receiving water).

APPENDIX I. **Ammonia** Tables

pH-Dependent Values of the CMC (Acute Criterion)

CMC, mg N/L		
pH	Salmonids Present	Salmonids Absent
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.1 1	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

Temperature and pH-Dependent Values of the CCC (Chronic Criterion) for Fish Early Life Stages Present

pH	*CCC* for Fish Early Life Stages Present, mg N/L									
	Temperature, C									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.77:
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	1.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	1.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	1.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	1.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	1.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Temperature and pH-Dependent Values of the CCC (Chronic Criterion) for **Fish** Early Life Stages Absent

CCC for Fish Early Life Stages Absent, mg N/L										
pH	Temperature									
	0-7	8	9	10	11	12	13	14	15"	16*
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36	5.97
6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25	5.86
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10	5.72
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73	5.37
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49	5.15
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22	4.90
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92	4.61
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59	4.30
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23	3.97
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85	3.61
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47	3.25
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71	2.54
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36	2.21
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03	1.91
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74	1.63
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06	0.990
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892	0.836
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754	0.707
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641	0.601
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548	0.513
9.0	0.790	0.740	0.694	0.651'	0.610	0.572	0.536	0.503	0.471	0.442

* At 15 *C* and above, the criterion for fish ELS absent **is** the same as the criterion for fish **ELS** present.

CCC for Fish Early Life Stages Present, mg N/L

Temperature, C

pH	0	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	6.67	6.67	6.46	6.06	5.68	5.33	4.99	4.68	4.39	4.12	3.86	3.62	3.39	3.18	2.98	2.80	2.62	2.46
6.6	6.57	6.57	6.36	5.97	5.59	5.25	4.92	4.61	4.32	4.05	3.80	3.56	3.34	3.13	2.94	2.75	2.58	2.42
6.7	6.44	6.44	6.25	5.86	5.49	5.15	4.83	4.52	4.24	3.98	3.73	3.50	3.28	3.07	2.88	2.70	2.53	2.37
6.8	6.29	6.29	6.10	5.72	5.36	5.03	4.72	4.42	4.14	3.89	3.64	3.42	3.20	3.00	2.82	2.64	2.47	2.32
6.9	6.12	6.12	5.93	5.56	5.21	4.89	4.58	4.30	4.03	3.78	3.54	3.32	3.11	2.92	2.74	2.57	2.41	2.25
7.0	5.91	5.91	5.73	5.37	5.04	4.72	4.43	4.15	3.89	3.65	3.42	3.21	3.01	2.82	2.64	2.48	2.32	2.18
7.1	5.67	5.67	5.49	5.15	4.83	4.53	4.25	3.98	3.73	3.50	3.28	3.08	2.88	2.70	2.53	2.38	2.23	2.09
7.2	5.39	5.39	5.22	4.90	4.59	4.31	4.04	3.78	3.55	3.33	3.12	2.92	2.74	2.57	2.41	2.26	2.12	1.99
7.3	5.08	5.08	4.92	4.61	4.33	4.06	3.80	3.57	3.34	3.13	2.94	2.76	2.58	2.42	2.27	2.13	2.00	1.87
7.4	4.73	4.73	4.59	4.30	4.03	3.78	3.55	3.32	3.12	2.92	2.74	2.57	2.41	2.26	2.12	1.98	1.86	1.74
7.5	4.36	4.36	4.23	3.97	3.72	3.49	3.27	3.06	2.87	2.69	2.53	2.37	2.22	2.08	1.95	1.83	1.72	1.61
7.6	3.98	3.98	3.85	3.61	3.39	3.18	2.98	2.79	2.62	2.45	2.30	2.16	2.02	1.90	1.78	1.67	1.56	1.47
7.7	3.58	3.58	3.47	3.25	3.05	2.86	2.68	2.51	2.36	2.21	2.07	1.94	1.82	1.71	1.60	1.50	1.41	1.32
7.8	3.18	3.18	3.09	2.89	2.71	2.54	2.38	2.23	2.10	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
7.9	2.80	2.80	2.71	2.54	2.38	2.24	2.10	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17	1.10	1.03
8.0	2.43	2.43	2.36	2.21	2.07	1.94	1.82	1.71	1.60	1.50	1.41	1.32	1.24	1.16	1.09	1.02	0.96	0.897
8.1	2.10	2.10	2.03	1.91	1.79	1.68	1.57	1.47	1.38	1.29	1.21	1.14	1.07	1.00	0.94	0.879	0.824	0.773
8.2	1.79	1.79	1.74	1.63	1.53	1.43	1.34	1.26	1.18	1.11	1.04	0.973	0.912	0.855	0.802	0.752	0.705	0.661
8.3	1.52	1.52	1.48	1.39	1.30	1.22	1.14	1.07	1.00	0.941	0.882	0.827	0.775	0.727	0.682	0.639	0.599	0.562
8.4	1.29	1.29	1.25	1.17	1.10	1.03	0.97	0.906	0.849	0.796	0.747	0.700	0.656	0.615	0.577	0.541	0.507	0.475
8.5	1.09	1.09	1.06	0.990	0.928	0.870	0.816	0.765	0.717	0.672	0.630	0.591	0.554	0.520	0.487	0.457	0.428	0.401
8.6	0.920	0.920	0.892	0.836	0.784	0.735	0.689	0.646	0.606	0.568	0.532	0.499	0.468	0.439	0.411	0.386	0.362	0.339
8.7	0.778	0.778	0.754	0.707	0.663	0.622	0.583	0.547	0.512	0.480	0.450	0.422	0.396	0.371	0.348	0.326	0.306	0.287
8.8	0.661	0.661	0.641	0.601	0.563	0.528	0.495	0.464	0.435	0.408	0.383	0.359	0.336	0.315	0.296	0.277	0.260	0.244
8.9	0.565	0.565	0.548	0.513	0.481	0.451	0.423	0.397	0.372	0.349	0.327	0.306	0.287	0.269	0.253	0.237	0.222	0.208
9.0	0.486	0.486	0.471	0.442	0.414	0.389	0.364	0.342	0.320	0.300	0.281	0.264	0.247	0.232	0.217	0.204	0.191	0.179